



Executive Summary

National Report on Biochemical Indicators of Diet and Nutrition in the U.S. Population, 1999-2002

Background

Although recommendations about diet and nutrition have been made by health agencies, it is not widely known for most nutritional indicators what levels are actually in people. Using advanced laboratory science and innovative techniques, the Division of Laboratory Sciences at the Centers for Disease Control and Prevention (CDC), National Center for Environmental Health (NCEH) has been in the forefront of efforts to assess the nutritional status of the U.S. population through monitoring nutritional indicators. Part of this NCEH effort has resulted in the creation of the *National Report on Biochemical Indicators of Diet and Nutrition in the U.S. Population, 1999-2002*, the first CDC publication that offers information on a wide range of biochemical indicators in a single document.

Inside the Report

The report showcases reference information about levels of 27 biochemical indicators in the bodies of the U.S. population. CDC scientists measured these levels in the blood and urine of people who took part in CDC's National Health and Nutrition Examination Survey (NHANES) during all or part of the four-year period from 1999 through 2002. The information is presented by age, sex, and race/ethnicity. The indicators showcased in the first* report include the following:

Water-Soluble Vitamins & Related Biochemical Compounds

- Folate (serum and red blood cell)
- Vitamin B12
- Homocysteine
- Methylmalonic acid

Fat-Soluble Vitamins & Micronutrients

- Vitamin A
- Vitamin E
- *gamma*-Tocopherol
- *alpha*-Carotene
- *trans-beta*-Carotene
- *beta*-Cryptoxanthine
- Lutein/zeaxanthin
- *trans*-Lycopene
- 25-Hydroxyvitamin D

Trace Elements

- Iodine
- Selenium

Iron-Status Indicators

- Ferritin
- Iron
- Total iron-binding capacity
- Transferrin saturation
- Protoporphyrin

Isoflavones & Lignans

- Genistein
- Daidzein
- *O*-Desmethylangolensin
- Equol
- Enterodiols
- Enterolactone

* Future issues of the report may include additional categories of indicators such as *trans* fatty acids and omega fatty acids, natural antioxidants and markers of oxidative stress, and botanicals and herbs.



Purpose of the Report

Overall, the purpose of this report is to improve understanding of the levels of biochemical indicators of diet and nutrition in the general U.S. population and in selected subpopulations. These data will help assess inadequate or excess intake and will inform analyses on the relation between biochemical indicators and health outcomes. Other potential public health uses of the information include the following:

- Establishing and improving existing population reference levels that physicians, clinicians, scientists, and public health officials can use to determine whether a person has, or a group of people has, an unusually high or low level of a biochemical indicator.
- Determining whether the nutritional status of special population groups, such as minorities, children, women of childbearing age, or the elderly is different from that of other groups, or whether it needs improvement.
- Tracking, over time, dietary and nutritional trends in the population.
- Assessing the effectiveness of public health efforts to improve the diet and nutritional status of U.S. residents.
- Stimulating research to perform more in-depth analyses of the NHANES data and to generate hypotheses for future nutrition and human health studies.

Interpreting the Data

This report presents reference information on selected biochemical indicators. A limited interpretation of relative differences between population subgroups is possible by identifying groups with non-overlapping confidence intervals. These observed differences, however, should not be interpreted as causal. The intent is to describe the characteristics of the population and of selected subgroups.

Observations that indicate adequate biochemical levels do not intend to signify consumption of healthful and balanced diets (as levels can be affected by food fortification and dietary supplements). It is also important to note that differences in biochemical levels between the various demographic groups represented in the report do not intend to suggest health problems. Independent research studies are required to determine which levels of biochemical indicators may indicate risk for disease.

It is beyond the scope of this report to explore the reasons for differences in observations derived from descriptive analysis. Also, the current study design does not permit CDC to estimate biochemical indicators on a state-by-state or city-by-city basis. For example, CDC cannot extract a subset of data and examine levels of folate that represent a state population.

*Centers for Disease Control and Prevention
National Center for Environmental Health
Division of Laboratory Sciences
NCEH Pub. No 2008-93c70*

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